

NEW SPECIES OF FISHES FROM COSTA RICA.

BY SETH EUGENE MEEK.

During the month of April last I collected fishes in some of the rivers of Costa Rica. The following paper gives an account of those species which appear to be undescribed.

In making this collection of fishes I wish to acknowledge the aid received from agents of the United Fruit Company, and from Dr. Alfaro and Prof. Tristan of San Jose.

A complete account of the collection will be published in the near future.¹

Astyanax robustus sp. nov.

Type No. 7582, F. M. N. H.; length 132 mm.; Virginia, Costa Rica.

Head 4.1 to 4.4; depth 2.8 to 3.0; D. 1, 9; A. 2, 27; scales $7\frac{1}{2}$, 37, $6\frac{1}{2}$.

Body robust, moderately compressed, the caudal peduncle especially deep; profile slightly convex; top of head convex; fontanelle large, extending from anterior margin of the orbit to nape; margin of upper lip slightly below the level of middle of the eye; lower jaw slightly the longer, the lip thick; maxillary to anterior third of orbit, its length 2.3 to 2.4 in head; diameter of eye 3.0 to 3.5; snout 4.2 to 4.6; cheek 2.6 to 2.8; maxillary teeth 4-4, the cusps 3 to 5; premaxillary teeth in 2 series, the outer 4-4, each of 3 to 5 cusps; inner series 5-5, similar to the outer but slightly larger; lower jaw with teeth in one series, the anterior teeth large 4-4, with 3 to 5 cusps, the lateral teeth 6-6 smaller and subcontinuous, the anterior ones usually with 3 cusps, the posterior ones of one cusp; gill rakers 7+9; a few near each end with their tips branched; dorsal fin behind ventrals, its origin nearer tip of snout than base of caudal by about a distance of diameter of eye; base of anal 3.0 to 3.2 in body; pectoral of 12 rays, its length 5.1 to 5.5; ventral 7.4 to 8.2, its rays 8; caudal peduncle 1.6 to 1.8 in head; lateral line complete; vertebrae 11+22=33.

Color dark brown, little silvery, fins in life with red or yellowish red, the body more or less tinged with the same color; all of the fins dusky.

¹ Issued September 18, 1912.

Description from specimens 120 to 140 mm. in length, Virginia River. Eggs small, one female contained about 7,000 eggs.

Cheirodon eigenmanni sp. nov.

Type No. 7583, F. M. N. H.; length 67 mm.; La Junta, Costa Rica.

Head 4.2 to 4.4; depth 2.5 to 2.6; D. 1,9; anal 2, 29 to 31; scales 46 to 48; 17 or 18 between dorsal and ventrals.

Body elongate, much compressed; profile evenly convex; top of head convex; fontanelle large; margin of upper lip slightly above level of middle of eye; mouth rather large; jaws subequal; maxillary to first third of eye, its length 2.3 to 2.4 in head; diameter of eye 2.6 to 2.9; snout 3.5 to 3.7; entire edge of maxillary toothed, 2-2 anterior ones denticulate, the remaining 6-6 canine; premaxillary teeth 5-5, denticulate, in one series; teeth of lower jaw denticulate, in one series of 6-6, these followed by 2-2 canine teeth; gill rakers 6+8; dorsal fin high its longest rays about 2.8 in body; base of anal 2.5 to 2.7; pectorals 4.3 to 4.7; ventrals 4.3 to 4.5, their tips reaching past origin of anal; caudal peduncle 2.1 to 2.2 in head, lateral line present on about 10 scales.

Color silvery, a black spot about half as large as eye mostly above and near termination of lateral line; lateral band very narrow anteriorly, becoming darker and broader and ending in an elongated black caudal spot which extends to end of middle caudal rays.

Named for Dr. C. H. Eigenmann, who has done more than any one else to increase our knowledge of the Characins, the most interesting family of fishes in the fresh waters of the Americas.

Gambusia umbratilis sp. nov.

Type No. 7584, F. M. N. H.; length 51 mm.; Guapilis, Costa Rica.

Head 4.1 to 4.5; depth 3.6 to 3.7; D. 1.7; A. 2.6; scales 7-28.

Body elongate, profile slightly convex, mouth small, the lower jaw the longer; outer series of teeth the larger; snout short, 4.2 to 4.7 in head; eye 2.5 to 2.8; gill rakers 15; pectoral 1.2 to 1.3; origin of dorsal slightly in advance of anal, midway between base of caudal and eye. Anterior anal rays the longest, 1 2 to 1.3 in head; caudal peduncle 1.4 to 1.6 in head.

This description from females 40 to 58 mm., two males 46 mm. have head 4.0; depth 3.7; eye 2.4 in head, snout 3.8; caudal peduncle 1.4; modified anal reaching slightly more than half way to base of caudal, .73 in head.

Color dark olivaceous, 6 to 10 dark bars on posterior part of the body much narrower than the interspaces; dorsal fin with a broad black bar near base and a second one at tip.

Gambusia turrubarensis sp. nov.

Type No. 7576, F. M. N. H.; length 61 mm.; Turrubares, Costa Rica.

Head 4.0 to 4.3; depth 3.3 to 3.6; D. 1, 6 or 7; A. 2, 6 or 7; scales 7-28.

Body elongate, profile convex; mouth small, with small lateral cleft; outer series of teeth the larger; eye 2.9 to 3.1 in head; snout 4.2 to 4.4; pectoral about as long as head; anal fin rounded, its longest rays 1.2 to 1.3 in head; origin of dorsal over last rays of anal, its distance to base of caudal 2 or nearly so, in its distance to tip of snout; gill rakers 21; caudal peduncle 1.3 to 1.4 in head (in females 55 to 76 mm.) one male (36 mm.) has head 3.9; depth 3.5; eye 2.6; snout 5; modified anal nearly reaching caudal, 2.4 in body, or nearly twice the length of the head.

Color (both sexes) olivaceous, sides with about 8 or 9 narrow dark bars on anterior three fourths of the body, fins all plain dusky.

Gambusia parismina sp. nov.

Type No. 7578, F. M. N. H.; length 52 mm.; Parismina, Costa Rica.

Head 3.5 to 3.8; depth 4.2 to 4.5; D. 1, 6 or 7; A. 2, 7; scales 8-28.

Body elongate, moderately compressed; top of head flat; mouth small, its gape extending $\frac{2}{3}$ distance to eye; lower jaw slightly the longer; upper jaw protractile; teeth fixed, in bands, the outer the larger; eye 2.6 to 2.7 in head; snout 3.6 to 3.8; gill rakers 12; pectoral 1.2 in head, of 12 rays, slightly below axis of the body; anal long, its first rays longest, their tips beyond tips of last ray when the fin is deflexed, its longest ray 1.3 in head; dorsal small, its margin rounded, its origin behind last anal ray, its distance from caudal 2.3 in its distance from tip of snout; the fin being wholly on posterior third of the body; caudal peduncle 2 in head.

Color dark olivaceous, dorsal with 2 faint dark cross bars, a large black spot with light margin at base of caudal; base of anal with a large black spot.

This species has the general aspect of *Rivulus*. One female contained 13 eggs, some with eye spots and a few with well-formed young. The species is viviparous, but our collection contains no males.

Poecilia pittieri sp. nov.

Type No. 7580, F. M. N. H.; length 68 mm.; La Junta, Costa Rica.

Head 4.1 to 4.4; depth 2.6 to 2.8; D. 1, 8; A. 2, 6 or 7; scales 8-28.

Body robust, compressed; mouth small, the teeth in narrow bands, the outer series the larger; lower jaw weak; mouth small; eye 2.5 to 2.8 in head; snout 3.4 to 3.8; pectoral 1.0 to 1.1; dorsal fin in advance of

anal, its origin midway between base of caudal and eye; origin of anal under about fourth anal ray, its free edge rounded, longest rays 1.1 to 1.2 in head; caudal peduncle deep, 1.1 to 1.2 in head.

Color dark olivaceous, the center of each scale lighter, a black blotch (♀) about twice as large as eye above origin of anal; color of male similar except posterior half of body with 7 dark cross bars (37 mm.) becoming faint in larger specimens.

Described from several females 43 to 65 mm. The males much resemble in general form the females. Specimens 45 to 53 mm. show following measurements: Head 3.9 to 4.0; depth 2.5; eye 2.7 in head; snout 4.2; pectoral 1.0, caudal peduncle 1.0; modified anal long and slender, its tip reaching base of caudal, its length .56 in head.

Alfaro gen. nov.

This genus belongs to the subfamily *Tomeurinae** in having the lower row of scales on each side with their inner surfaces together forming a knife-like edge behind the anal fin; the dorsal fin is wholly on the posterior third of the body; the 2 first rays of the anal are elongate and modified, but less so than in other viviparous genera in this family, which have the elongate anal.

I dedicate this genus to Dr. A. Alfaro, Director of the National Museum of Costa Rica and the best known scientist of the Republic.

Alfaro acutiventralis sp. nov.

Type No. 7579, F. M. N. H.; length 75 mm.; Guapilis, Costa Rica. Head 4.2 to 4.3; depth 3.4 to 3.7; D. 1, 6 or 7; A. 1, 8 or 9; scales 32 to 34.

Body elongate, much compressed, profile from dorsal to nape straight, a slight angle at nape; top of head flat, covered with scales; mouth rather large, its gape half way to eye; teeth fixed in both jaws, in bands, those of the upper jaw subequal, the outer series of lower jaw enlarged; lower jaw the longer; premaxillary very protractile; maxillary small, its tip reaching below anterior margin of the orbit; eye 2.7 to 3.1 in head; snout 2.7 to 2.8; dorsal fin posterior, its distance from base of caudal about 2.3 in its distance from tip of snout; pectoral broad, of 13 rays, situated on axis of body, its length 1.2 to 1.3 in head; anterior rays of anal fin long, falcate, longest .9 to 1.0 in head; ventrals short, its rays 6; gill rakers 17 or 18; lateral line on row of scales above pectoral for 7 or 8 scales, then on the row below to base of caudal; many of the scales on the posterior half of the body with a small pore, peritoneum dusky, alimentary canal short; vertebrae 20+15=35.

* Eigenmann, Mem. Car. Mus., vol. v, 460, 1912.

Color olivaceous, no spots or bars; vertical fins slightly dusky. One female 90 mm. in length contained 142 eggs. None of the eggs showed eye spots.

This description is based on several specimens 50 to 90 mm. in length. Several males 46 to 62 mm. show head 3.8 to 3.9; depth 3.1 to 3.6; eye 2.8 to 3.1 in head; snout 2.9 to 3.2; pectoral 1.3 to 1.4; modified anal 1.0 to 1.1. The anal fin is forward and contains rays 1, 6; the two anterior branched rays form the modified portion of the fin. The dorsal fin of the males is not enlarged as is usually the case in the viviparous species of this family.

It inhabits rocky streams.

Cichlasoma tuba sp. nov.

Type No. 7581, F. M. N. H.; length 222 mm.; Victoria, Costa Rica.

Head 3.3 to 3.6; depth 2.5 to 2.9; D. XVI, 13 or 14; A. IV, 9; scales 33.

Body elongate, compressed, the anterior profile convex; mouth small the margin of the upper lip on level with upper third of base of pectoral; upper jaw the longer; teeth with blunt tips, more conspicuous in larger specimens; lips thick, in some specimens developed as fleshy lobes, fold of lower lip free; maxillary not reaching eye, its length 3.0 to 3.5 in head; eye 4.2 to 4.8; snout 2.2 to 2.5; preorbital 3.8 to 4.0; postorbital 2.4 to 2.6; gill rakers short and blunt, 3+9; origin of dorsal fin slightly behind pectorals, its spinous portion low, the fourth or fifth spine 3.0 to 3.9 in head; anal base 4.6 to 5.1 in body, its spines 4, very exceptionally 3 or 5; second spine 2.7 to 3.1 in head; pectorals short 4.1 to 4.6 in body; ventrals 4.2 to 5.0; caudal peduncle 1.9 to 2.1; 4 scales between the lateral line and the middle of the dorsal; caudal fin lunate, the dorsal and anal rays not produced, their tips scarcely to base of caudal.

Color dark olivaceous, sides with 6 to 8 vertical bars, the first one near tip of pectoral, soft dorsal and caudal with faint spots. Taken in clear running water.

Cichlasoma spilotum sp. nov.

Type No. 7586, F. M. N. H.; length 148 mm.; Victoria, Costa Rica.

Head 3.3 to 3.5; depth 2.3 to 2.6; D. XIX or XX, 9 or 10; A. VIII or IX, 7; scales 33 to 35.

Body elongate, compressed, profile steep, snout blunt; mouth small, subinferior, the margin of the upper lip on level with upper third of base of pectoral; fold of lower lip broadly interrupted in the middle; maxillary not reaching vertical from anterior margin of the eye, its

length 3.3 to 3.5 in head; diameter of eye 3.4 to 3.9; snout 2.2 to 2.4; preorbital 3.2 to 3.7, postorbital 2.5 to 2.7; pectoral 1.1 to 1.2; ventral .7 to .9; base of anal .9 to 1.0. Caudal peduncle 2.2 to 2.4; spinous dorsal rather high, the 6th spine 1.9 to 2.2 in head; the last dorsal spine 1.5 to 1.6; last anal spine 1.5 to 1.7; gill rakers short, 9, dorsal, anal and ventrals with their rays produced; caudal fin emarginate; soft dorsal with scales on interradi al membranes.

Color olivaceous, sides with 6 or 7 indistinct cross bars. A longitudinal dark lateral band about as wide as eye, a large black spot on side and a smaller one at base of caudal; vertical fins usually with many black spots.

This species resembles *C. balteatum* but differs in having a shorter head and smaller eye, and longer dorsal and anal spines.

Neetroplus fluviatilis sp. nov.

Type No. 7585, F. M. N. H.; length 116 mm.; Costa Rica River near Guapilis, Costa Rica.

Head 3.3; depth 2.6; D. XVII or XVIII, 9; A. VI, 6; scales 34.

Body elongate, compressed, profile very convex; mouth small, sub-inferior, the lower jaw the shorter, teeth compressed; preorbital very deep, equaling the postorbital, 2.6 in head; eye 3.9; snout 2.2; inter-orbital very convex; scales on breast, nape, and along each side of dorsal fin, very small; pectoral fins 1.4 in head; ventrals slightly longer than head; dorsal fin low, the last spine 2.2 in head, the 6th spine 3.1, last anal spine 2.2; base of anal 1.2 in head; caudal peduncle 2.2 in head, gill rakers very blunt, 3+6; caudal fin rounded.

Color dark olivaceous, 6 or 7 faint dark bars on the sides. Known from the type and one other specimen (105 mm.) from Costa Rica River near Guapilis.

Gobiesox costaricensis sp. nov.

Type No. 7577, F. M. N. H.; length 62 mm.; Zent, Costa Rica.

Head 2.7; depth 5.6; D. 6; A. 4.

Body broad, depressed anteriorly, teeth incisor, their edges entire; dorsal and anal fins small, the latter under posterior half of the former. Head broader than long, width of mouth about $\frac{3}{4}$ width of head.

Color olivaceous, with 4 or 5 darker bars on back extending on sides. Caudal barred, a black spot at base of anterior rays of dorsal.

The following are measurements (mm.) of the specimens obtained:

	Zent.	Zent.	Turrubares	Turrubares
Total length	62	50	43	42
Length of body	50.4	41	35	35.2
Length of head	19	14.7	12	11.5
Depth	9	6.5	6	6.1
Width of head	19.4	15.7	12.7	12.5
Width of mouth	12.3	8	6.7	6.4
Interorbital width	5.6	3.7	3.8	3.8
Diameter of ventral disc	18.5	15.4	13.4	13.4